Lower prevalence of protective antibodies for 2015/2016 influenza A(H1)pdm circulating strains comparing to seroprevalence for 2009 influenza A(H1)pdm virus

Raquel Guiomar a, Patrícia Conde a, Paula Cristóvão a, Inês Costa a, Pedro Pechirra a
Portuguese Laboratory Network for the Diagnosis of Influenza Infection

* National Influenza Reference Laboratory, Infectious Diseases Department
National Institute of Health Dr. Ricardo Jorge, Portugal

raquel.guimaro@insa.min-saude.pt
+351.21.7519216
orcid.org/0000-0002-4563-6315

Background:
Since 2009, influenza A(H1)pdm is circulating in the human population infecting in different ways specific age groups. The study aims to assess the seroprotection for A/California /07/2009 vaccine strain and evaluate the seroprotection for the circulating A(H1)pdm strains (clade 6B) during 2015/2016 in the Portuguese population. Seroepidemiological data can determine the vulnerable populations to disease and support intervention and action regarding vaccination programmes and other preventive measures, particularly in high-risk groups.

Methods:
To study influenza immunity a non-probabilistic sample was used. Samples were collected from people attending to hospital laboratories (n=13) for other reasons aside from influenza infection. We developed a cross-sectional study based on a convenience sample of 734 sera collected during July 2016, from all age groups (0–4; 5–14; 15–44; 45-64 and ≥65 years old), both genders, covering mainland and Atlantic islands. Sera were randomly selected. All samples were anonymized and recorded data: district residence/samples collection, gender and age. Antibody titers to A(H1)pdm virus strains [A/California/07/2009 and A/Lisboa/58/2015 (clade 6B)] were assessed by hemagglutination inhibition (HI) assay. HI titer ≥40 was considered protective. Seroprevalence estimates, overall and by age group, were calculated with 95% confidence intervals (95% CI). The HA1 subunit of the hemagglutinin gene from A(H1)pdm viruses used in HI were sequenced.

Results:
In July 2016, the prevalence of protective antibodies for influenza A/California/07/2009 was 38% (95% CI: 34–41) and for A/Lisboa/58/2015 was 23% (95% CI: 21–27).

Conclusions:
Although 38% of study population have demonstrated to have seroprotection for A(H1)pdm vaccine strain this could not represent seroprotection to the currently circulating A(H1)pdm strains (6B.1 clade). Individuals in the age group of 45-64 years old are more susceptible to infection by currently circulating influenza A(H1)pdm viruses. The presence of K163Q (Sa), S185T (Sb) and S203T (Ca1), belonging to 6B.1 clade.